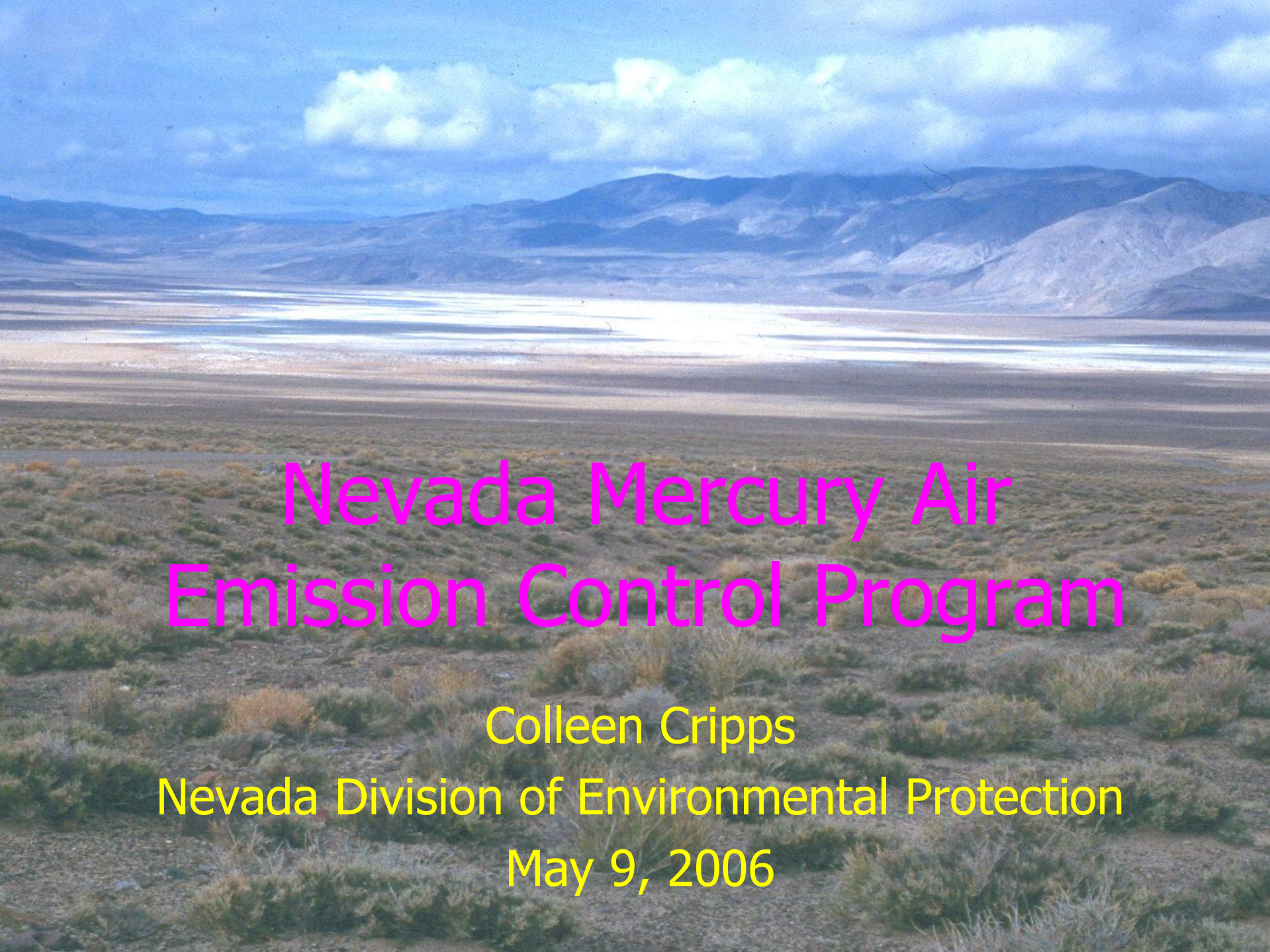

Nevada Mercury Air Emission Control Program

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Overview

- Background on Hg and Mining
- Voluntary Hg Reduction Program
- Overview of the Nevada Mercury Control Program
- Next Steps

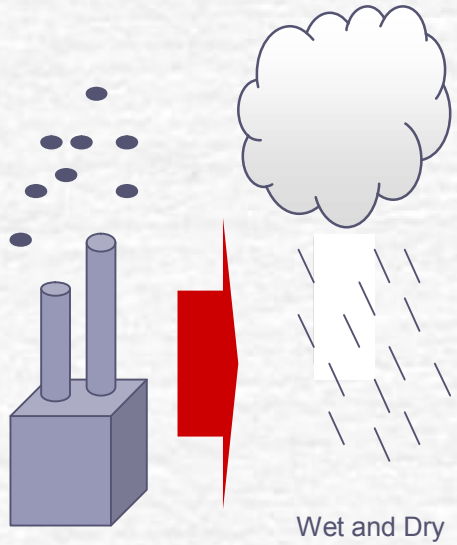
Mercury Basics

- Naturally occurring
- Geologically concentrated
- Associated with volcanic activity, gold deposits, and geothermal springs
- Cycles extensively in the environment
- Complex chemistry
- Transported globally/regionally/locally

Mercury Basics

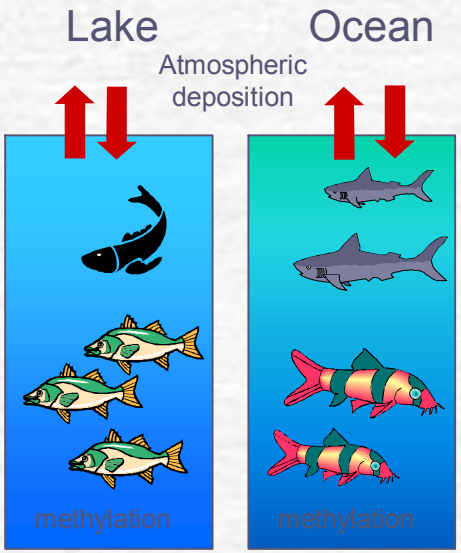
- Anthropogenic sources
  - Coal combustion
  - Hospital and municipal waste incinerators
  - Thermal treatment of ore in precious metal mining
  - Geothermal heat recovery
  - Historical mining releases

Mercury Emissions Contribute to Exposure to Mercury



Emissions to the Air

Wet and Dry Deposition

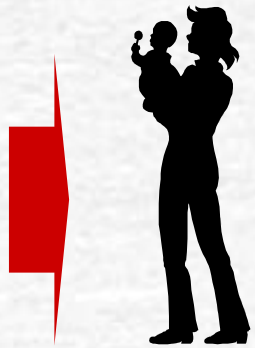


Mercury transforms into methylmercury in soils and water, then can bioaccumulate in fish

Fishing

- commercial
- recreational
- subsistence

Humans and wildlife affected primarily by eating contaminated fish



Impacts

- Best documented impacts on the developing fetus: impaired motor and cognitive skills
- Possible cardiovascular, immune, and reproductive system impacts

Emissions and Speciation → **Atmospheric Transport and Deposition** → **Ecosystem Transport, Methylation, and Bioaccumulation** → **Consumption Patters** → **Human Exposure**

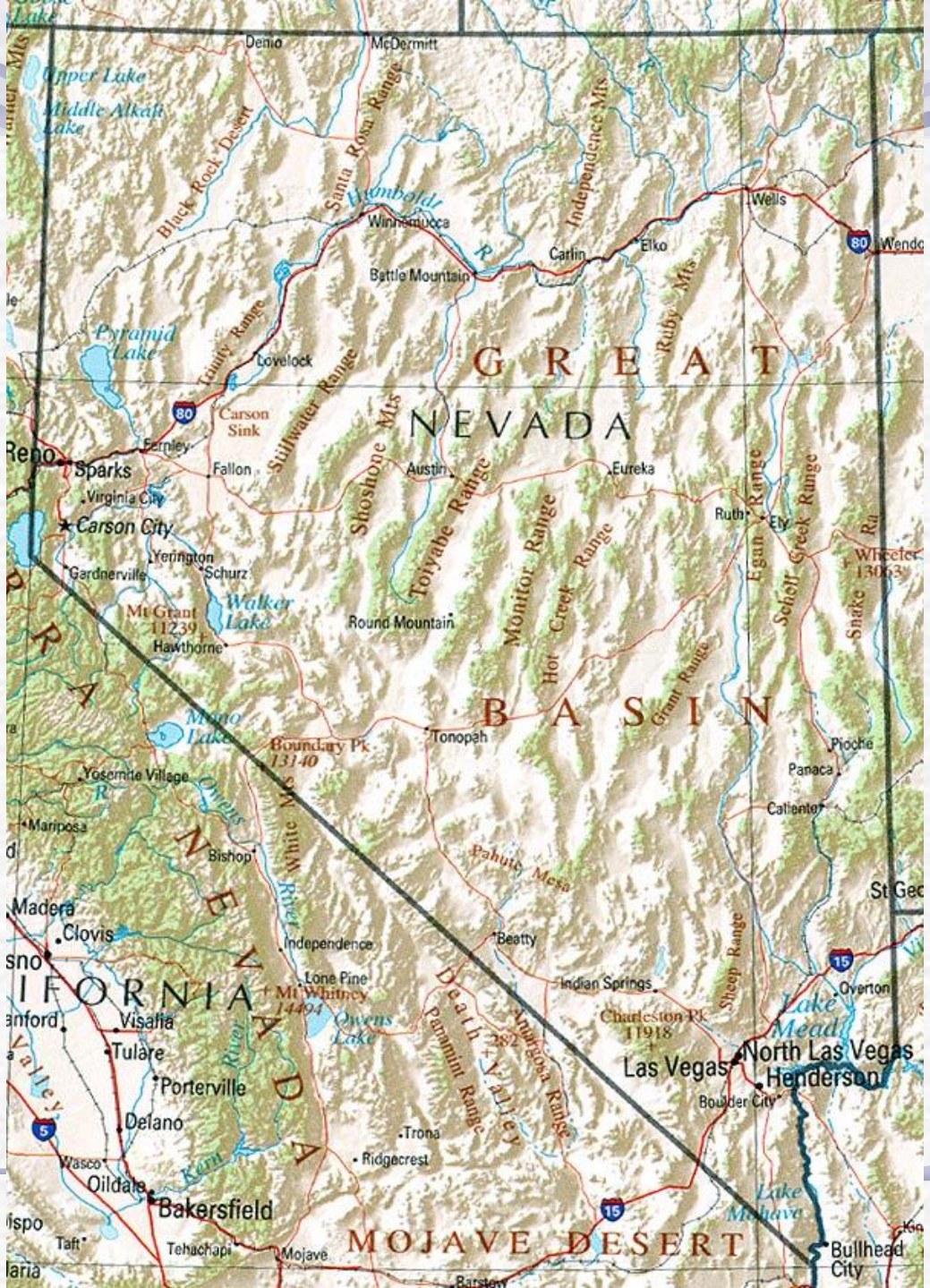
- The primary pathway of human exposure to mercury in the U.S. is through eating contaminated fish.
- Power plants emit approximately 48 tons of mercury and are the largest source of mercury emissions in the U.S. (approximately 41%).

- 1997 – 5,500 metric tons Hg released into the global pool world wide
- 1997 – 159 metric tons emitted from US industrial sources
- 2002 – Global emissions continue to increase while US emissions decreased to 111.4 metric tons
- 2000 – Baseline Hg emissions from mining are 10.5 tons
- Current estimates from mining are 2 tons

- EPA modeling data suggests that about 21% of US emissions of new mercury are deposited in the lower 48 states
- The rest is transported into the global Hg pool

Mercury and Mining

- Naturally occurring and geologically concentrated in volcanic and some sedimentary rock
- Mercury belt
- Co-located with gold in disseminated deposits (gold concentrations are very low and Hg lower)
- During leaching and concentration processes Hg behaves like the gold



Mercury and Mining

- Thermal processes drive off the Hg so gold can be recovered
- Thermal processes are relatively new
- First permitted roaster in the early 90's
- Not historic legacy mining

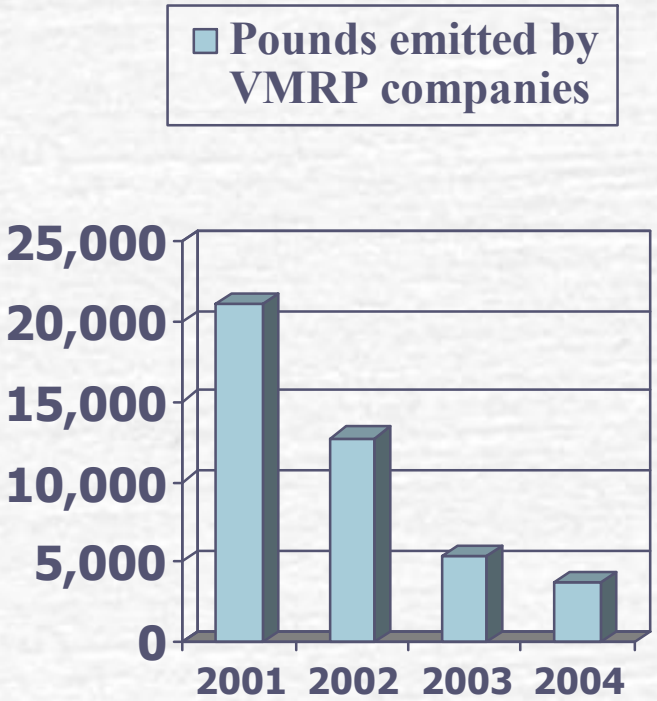
Genesis of the voluntary mercury reduction program

- 1998: Metal mining industry required to submit mercury emissions with Toxic Release Inventory (TRI)
- 2000: Released 1998 TRI numbers show five mining operations account for more than 90% of emissions
- 2001: EPA site tours to analyze sources and controls
- 2002: NDEP and EPA develop Voluntary Mercury Reduction Program (VMRP) with four mining companies with largest emissions

Goals for Voluntary Mercury Reduction Program

- Achieve significant, permanent and rapid reductions in mercury air emissions from precious metal mining operations
- Achieve reductions through approaches that are most suitable for each individual mining facility
- Encourage flexibility in technology innovation and greater reductions per transaction cost

Program resulted in rapid and significant reductions



- From a 2001 baseline of 21,098 pounds, reduced emissions by:
- 50% in 2002
- 74% in 2003
- 82% in 2004

2005 timeline for re-evaluating voluntary program

- Envisioned extension of the program beyond 2005
- Throughout 2005 initiated meetings with stakeholders including EPA, state regulators, the environmental community and industry representatives to identify opportunities for enhancing Nevada's mercury program
- Incorporated proposals and concerns from stakeholders into goals for a new program

VMRP v. NMCP

- Regulatory and permitting process
- Expanded coverage to all precious metal mining operations
- Establishes monitoring, testing, O & M recordkeeping and reporting requirements
- Improved and additional controls
- Unit level applicability instead of by facility

Through the new regulatory program NDEP focused on…

- Controlling Hg emissions from thermal processes
- Regulatory and permitting process designed to ensure that Maximum Achievable Control Technology (MACT) level controls are permitted and operated effectively
- Control mercury air emissions to the maximum extent possible
- Mechanism to ensure the controls continue to be improved

First requirement

- Questionnaire
- Developed by NDEP and EPA
- Submitted by March 15 and includes info on:
  - Mercury content of the ore
  - Existing thermal emission units
  - Existing controls and emission reductions achieved by those controls
  - Plans to install new controls
- Allows us to collect a lot of data from the sources that will be used as we implement the program, used to establish tiers, collect fees, and make a de minimus determination

NMCP Overview

- Three Tiered Program
  - Tier 1 - Current VMRP units
  - Tier 2 – All other units at metal mining facilities that process Hg containing ore and have thermal processes with the potential to emit Hg
  - Tier 3 – either no potential to emit Hg emissions or their emissions are so low that controls aren’t warranted

Tier 3

- Three ways:
  - If a facility is determined to have no PTE, it will be deemed Tier 3
  - Based on the information provided in the questionnaire, DEP may establish a de minimus criteria that would allow units to become Tier 3
  - A facility could petition the DEP for Tier 3 status

	Phase I	Phase II
Tier 1 (Hg permit required)	Spec./Source Testing Est. Perf. Criteria Permit Existing Controls	NV MACT Process
Tier 2 (Hg permit required)	Same as Tier I except: Longer timelines Testing in Phase II	NV MACT Process
Tier 3 (Minor source operating permit)	Annual Demonstration and Certification Reqmts in Op Permit	
New and modified	Go directly to Phase II	NV MACT Process

Phase II – NV MACT

- Determination of best available control technology (aka NV MACT) for each type of emission unit. The NV MACT would be established in accordance with the CAA Section 112(d)
- Any enhancements to monitoring, recordkeeping, reporting and O&M must also be evaluated and included as part of the NV MACT permit evaluation
- Included in each facility's Hg permit.
- For Title V facilities, the Hg permit would be rolled into the facility's operating permit upon renewal or when the facility's permit is reopened

NV MACT Process

- Company submits application with a MACT analysis
- Review by DEP
- Draft a permit containing a TSD
- Public notice
- Final action

Early Reduction Credit

- In order to provide an incentive… For either Tier 1 or Tier 2 units, the facility could submit a request to install additional controls on a specific unit prior to our formal evaluation of BAC (aka the NV MACT determination)

- If DEP agrees, a Hg permit would be issued and the controls would be installed.
- If more stringent controls are identified under the MACT, they would get at three year grace period
- MACT controls would be installed 3 years after sources that did not apply early controls.

Next Steps

- Program became effective on May 4
- Information from questionnaires is being compiled
- Permit application has been developed and is available
- Speciated source tests are being conducted
- We received an air toxics research grant
- Additional research on fugitive emissions is being funded by the industry


Questions?
www.ndep.nv.gov/mercury

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